On Obtaining Integro-Differential Equations for the Equilibrium of Inclined
Shells

T_μ^σ ($U_{(i)\alpha}$) and moments M_μ^σ ($U_{(i)\alpha}$) applied to the periphery of the middle surface of the shell, on the auxiliary displacements; $U_{(i)\alpha}$ can be considered as components of the Green tensor for a shell, on the middle surface of which an arbitrary load X^β acts, and dS_Q is an element of the surface in the vicinity of point Q. The authors derive formulae for the nuclei $K_{(\alpha)}^j$ and $L_{(\alpha)}^j$ and for the operators $A_{(i)\alpha}$ and $A'_{(i)\alpha}$, making use of the corresponding equations in V.Z. Vlasov's technical theory of inclined shells /Ref. 3/ and in A. Lyav's paper /Ref. 4/ As an example, the authors

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On Obtaining Integro-Differential Equations for the Equilibrium of Inclined Shells

SOV-21-58-4-6/29

consider the computation of an inclined hinged shell (whose projection on a plane is rectangular) acted upon by an evenly distributed load.   There are 5 Soviet references.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnic Institute).

PRESENTED: By Member of the AS UkrSSR, G.N. Savin

SUBMITTED: July 10, 1957

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

1. Shells--Mathematical analysis   2. Differential equations --Applications   3. Operators (Mathematics)--Applications 4. Shells--Stability

Card 3/3

SOV/179-59-1-24/36

AUTHORS: Fradlin, B. N. and Shakhnovskiy, S. M. (Kiyev)

TITLE: Functional Equilibrium Equations of Sloping Shells (O funktsional'nykh uravneniyakh ravnovesiya pologikh obolochek)

ABSTRACT: Using the method proposed by Kil'chevskiy (Refs.1 and 2) the problem of equilibrium of a sloping shell is reduced to the investigation of a system of functional equations. There are 6 Soviet references.

SUBMITTED: June 6, 1958.

Card 1/1

FRADLIN, B.N. (Kiyev); SHAKHNOVSKIY, S.M. (Kiyev)

Functional equations of the equilibrium of flat shells. Izv.
AN SSSR.Otd.tekh.nauk.Mekh. i mashinostr. no.2:144-149 Je-J
'59.
(MIRA 12:5)
(Elastic plates and shells)

/6.5635

68170

S/179/59/000/06/021/029
E081/E141

AUTHORS: Fradlin, B.N., and Shakhnovskiy, S.M. (Kiyev)

TITLE: The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 6, pp 132-134 (USSR)

ABSTRACT: In conformity with the method of N.A. Kil'chevskiy, the integral equilibrium equation for a sloping shell of rectangular plan and with hinged support round the contour has the form (1, 2)

$$u_{(i)\beta}(M, N) = v_{(i)\beta}(M, N) - \int_0^a \int_0^b K_{(\beta)}{}^j(Q, M) \, u_{(i)j}(Q, N) \, dx_Q \, dy_Q \qquad (1)$$

where, here and subsequently, $i, \beta = 1,2,3$; $a = 1, 2$; $j = 1,2,3$ and performs summation; $m, n = 1,2$.

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If we choose an auxiliary system of displaced points on a hinged – supported plate, coinciding with the plan of the shell, arising under the action of unit forces directed parallel with the coordinate axes, we find

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$$v_{(i)\beta}(P, R) = \sum_{m,n}' A_{mn}^{(i)\beta} Z_{mn}^{\beta}(P) Z_{mn}^{1}(R) \qquad (2)$$

where
$$Z_{mn}^{1}(R) = \cos \frac{m\pi x_R}{a} \sin \frac{n\pi y_R}{b},$$

$$Z_{mn}^{2}(R) = \sin \frac{m\pi x_R}{a} \cos \frac{n\pi y_R}{b},$$

$$Z_{mn}^{3}(R) = \sin \frac{n\pi x_R}{a} \sin \frac{n\pi y_R}{b},$$

$$A_{mn}^{(1)1} = \frac{4\varepsilon}{\pi^2 Eh} \frac{\gamma_{mn}}{\omega_{mn}^2}, \qquad A_{mn}^{(2)2} = \frac{4\varepsilon}{\pi^2 Eh} \frac{\delta_{mn}}{\omega_{mn}^2},$$

$$A_{mn}^{(3)3} = \frac{48(1-\nu^2)\varepsilon a^2}{\pi^4 Eh^3} \frac{1}{\omega_{mn}^2},$$

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$$A_{mn}^{(1)2} = A_{mn}^{(2)1} = -\frac{4(1+\nu)^2 \varepsilon^2}{\pi^2 Eh} \frac{mn}{\omega_{mn}^2},$$

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E081/E141

The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

$$A_{mn}^{(\alpha)3} = A_{mn}^{(3)\alpha} = 0 \qquad (\varepsilon = a/b),$$

$$\gamma_{mn} = (1 - \nu^2)\,m^2 + 2(1 + \nu)\varepsilon^2 n^2,$$

$$\delta_{mn} = 2(1+\nu)m^2 + (1 - \nu^2)\varepsilon^2 n^2, \qquad \omega_{mn} = m^2 + \varepsilon^2 n^2 .$$

* Without going into details, all operations used below on the series (2) follow either immediately or with the aid of the theory of generalised functions. This representation of tangential displacements was used by N.I. Remizov in the candidate dissertation "Integral Equations of Equilibrium of Thin Elastic Cylindrical Shells" Kiyev Polytechnical Institute 1958.

Using the differential equilibrium equations of a sloping shell (3) to determine the kernel $K_{(\beta)}^j$, we obtain (2)

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$$K_{(\alpha)}^3 = \frac{Ehk_1}{1 - \nu^2}\left[\rho_1 \frac{\partial v_{(\alpha)1}}{\partial x} + \rho_1 \frac{\partial v_{(\alpha)2}}{\partial y}\right],$$

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The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

$$K_{(3)}^1 = -\frac{Ehk_1\rho_1}{1-\nu^2}\frac{\partial v_{(3)3}}{\partial x}, \quad K_{(3)}^2 = -\frac{Ehk_1\rho_2}{1-\nu^2}\frac{\partial v_{(3)3}}{\partial y},$$

$$K_{(3)}^3 = \frac{Ehk_1^2\rho_3}{1-\nu^2}v_{(3)3}, \quad K_{(\alpha)}^1 = K_{(\alpha)}^2 = 0$$

where $\rho_1 = 1 + \nu\varkappa$, $\rho_2 = \nu + \varkappa$, $\rho_3 = 1 + 2\nu\varkappa + \varkappa^2$,

$$\varkappa = k_2/k_1$$

From (2) we have

$$K_{(\beta)}^j(Q, M) = \sum_{m, n} B_{mn}^{(\beta)j} Z_{mn}^j(Q) Z_{mn}^\beta(M) \tag{3}$$

where

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$$B_{mn}^{(1)3} = -\frac{4\varepsilon k_1}{\pi a}\frac{m\alpha_{mn}}{\lambda_{mn}^2}, \quad B_{mn}^{(2)3} = \frac{4\varepsilon^2 k_1}{\pi a}\frac{n\beta_{mn}}{\lambda_{mn}^2},$$

$$B_{mn}^{(3)1} = -\frac{48\varepsilon^2\rho_1 k_1 a}{\pi^3 h^2}\frac{m}{\lambda_{mn}^2}, \quad B_{mn}^{(3)2} = -\frac{48\varepsilon^2\rho_2 k_1 a}{\pi^3 h^2}\frac{n}{\lambda_{mn}^2}$$

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The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

$$B_{mn}^{(3)3} = \frac{48\varepsilon k_1 \rho_3 a}{\pi^4 h^2} \frac{1}{\omega_{mn}^2} , \qquad B_{mn}^{(a)1} = B^{(a)2} = 0,$$

$$\alpha_{mn} = \rho_1 m^2 - (\prec - \lambda - 2)\varepsilon^2 n^2, \quad \beta_{mn} = [1 - (\lambda+2)\gamma]m^2 -$$
$$- \rho_2 \varepsilon^2 n^2$$

The solution of the system of integral equations (1) is sought in the form

$$u_{(i)\beta}(R,N) = v_{(i)\beta}(R,N) + \sum_{m,n} C_{mn}^{(i)\beta} Z_{mn}^{\beta}(R) Z_{mn}^{i}(N) \quad (4)$$

Substituting (4) in (1) and comparing coefficients of the products
$$Z_{mn}^{\beta}(M) \; Z_{mn}^{i}(N)$$
in both parts of the corresponding relationships, we obtain

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$$C_{mn}^{(i)\beta} = - \frac{a^2}{4\varepsilon} \sum_{j} B_{mn}^{(\beta)j} [A_{mn}^{(i)j} + C_{mn}^{(i)j}]$$

The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

Hence

$$C_{mn}^{(i)\alpha} = -\frac{a^2 B_{mn}^{(\alpha)3}\left[4\varepsilon A_{mn}^{(i)3} - a^2\delta_{mn}^{(i)}\right]}{16\varepsilon^2 + a^2\varepsilon_{mn}} ,$$

$$C_{mn}^{(i)3} = -\frac{a^2\left[4\varepsilon\delta_{mn}^{(i)} + \varepsilon_{mn}A_{mn}^{(i)3}\right]}{16\varepsilon^2 + a^2\varepsilon_{mn}}$$

(5)

where

$$\varepsilon_{mn} = 4\varepsilon B_{mn}^{(3)3} - a^2\left[B_{mn}^{(3)1}B_{mn}^{(1)3} + B_{mn}^{(3)2}B_{mn}^{(2)3}\right]$$

$$\delta_{mn}^{(i)} = A_{mn}^{(i)1}B_{mn}^{(3)1} + A_{mn}^{(i)2}B_{mn}^{(3)2} .$$

(6)

Calculation by formula (5) gives

$$C_{mn}^{(1)1} = \frac{4\varepsilon C}{\pi^2 Eh}\frac{m^2\alpha_{mn}^2}{\omega_{mn}^2\,\Omega_{mn}}, \quad C_{mn}^{(2)2} = \frac{4\varepsilon^2 C}{\pi^2 Eh}\frac{n^2\beta_{mn}^2}{\omega_{mn}^2\,\Omega_{mn}}$$

$$C_{mn}^{(3)3} = -\frac{4\varepsilon C^2}{k_1^2 a^2 E_1 h}\frac{\theta_{mn}^2}{\omega_{mn}^2\,\Omega_{mn}},$$

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The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

$$C_{mn}^{(1)2} = C_{mn}^{(2)1} = - \frac{4\varepsilon^2 C}{\pi^2 Eh} \frac{mn\alpha_{mn}\beta_{mn}}{\Omega_{mn}^2 \gamma_{mn}}$$

$$C_{mn}^{(1)3} = C_{mn}^{(3)1} = \frac{4\varepsilon C}{\pi Ehk_1 a} \frac{m\alpha_{mn}}{\gamma_{mn}},$$

$$C_{mn}^{(2)3} = C_{mn}^{(3)2} = - \frac{4\varepsilon^2 C}{\pi Ehk_1 a} \frac{n\beta_{mn}}{\gamma_{mn}}$$

where

$$\Omega_{mn} = \lambda m^2 + \varepsilon^2 n^2, \quad \gamma_{mn} = \Omega_{mn}^4 + C\Omega_{mn}^2,$$

$$C = \frac{12 (1 - \vartheta^2) a^4 k_1^2}{\pi^4 h^2} .$$

On the basis of the relations (4) and (2) the required solution of the system of equations (1) can be put in the form

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$$u_{(i)\beta}(M,N) = \sum_{m,n} D_{mn}^{(i)\beta} Z_{mn}^\beta (M) Z_{mn}^1 (N) \qquad (7)$$

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The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

where

$$D_{mn}^{(1)1} = \frac{4\varepsilon}{\pi^2 Eh} \frac{1}{\omega_{mn}^2} \left(\gamma_{mn} + \frac{Cm^2 \alpha_{mn}^2}{\Omega_{mn}} \right);$$

$$D_{mn}^{(1)3} = D_{mn}^{(3)1} = \frac{4\varepsilon C}{\pi Ehk_1 a} \frac{m\alpha_{mn}}{\Omega_{mn}}$$

$$D_{mn}^{(2)2} = \frac{4\varepsilon}{\pi^2 Eh} \frac{1}{\omega_{mn}^2} \left(\delta_{mn} + \frac{C\varepsilon n^2 \beta_{mn}^2}{\Omega_{mn}} \right),$$

$$D_{mn}^{(2)3} = D_{mn}^{(3)2} = -\frac{4\varepsilon^2 C}{\pi Ehk_1 a} \frac{n\beta_{mn}}{\Omega_{mn}}$$

$$D_{mn}^{(3)3} = \frac{4\varepsilon}{\pi^2 Eh} \frac{C}{k_1^2 a^2} \frac{1}{\omega_{mn}^2} \left(1 - \frac{C\theta_{mn}^2}{\Omega_{mn}} \right)$$

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$$D_{mn}^{(1)2} = D_{mn}^{(2)1} = -\frac{4\varepsilon^2}{Eh} \frac{mn}{\omega_{mn}^2} (1+\nu)^2 + \frac{C\alpha_{mn}\beta_{mn}}{\Omega_{mn}}$$

In this way all components of Green's tensor are obtained
for the equilibrium problem of a rectangular plan sloping

The Determination of Green's Tensor in Equilibrium Problems of a Sloping Shell

shell with hinged support around the contour. This solution coincides with the known particular solutions of V.Z. Vlasov (3) (in the case of unit normal load) and M. Mishonov (4) (in the case where unit forces are directed along the tangent to the middle surface of the shell). The displacements of points in the middle surface of the shell under the action of an arbitrary load $X^i(N)$ are found from the formula

$$u_\beta(M) = \int_0^a \int_0^b X^i(N)\, u_{(i)\beta}\,(M,\,N)\, dx_N dy_N \tag{8}$$

In particular, for the problem of equilibrium of a shell under the action of a uniformly distributed normal load q, formula (8) gives

$$u_\beta(M) = \frac{4a^2 q}{\pi^2 \varepsilon} \sum_{m,n=1,3,5,\ldots}^{\infty} \frac{D_{mn}^{(3)\beta}}{mn}\, z_{mn}^{\beta}(M)$$

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or

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$$u_1(M) = \frac{qa^4}{Eh^3} \frac{192(1-\nu^2)k_1 a}{\pi^7} \sum_{m,n=1,3,5\ldots}^{\infty} \frac{\alpha_{mn}}{n\,\lambda_{mn}} Z_{mn}^1(M)$$

$$u_2(M) = -\frac{qa^4}{Eh^3} \frac{192(1-\nu^2)\varepsilon k_1 a}{\pi^7} \sum_{m,n=1,3,5\ldots}^{\infty} \frac{\beta_{mn}}{m\,\lambda_{mn}} Z_{mn}^2(M)$$

$$u_3(M) = \frac{qa^4}{Eh^3} \frac{192(1-\nu^2)}{\pi^6} \sum_{m,n=1,3,5\ldots}^{\infty} \frac{\lambda_{mn}^2}{mn\,\lambda_{mn}} Z_{mn}^3(M)$$

The equation for the deflection may be written

$$u_3(M) = \frac{qa^4}{Eh^3} \frac{192(1-\nu^2)}{\pi^6} \sum_{m,\ n=1,3,5,\ldots}^{\infty} \frac{1}{mn\,\lambda_{mn}^2}$$

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$$\left(1 - \frac{C\theta_{mn}^2}{\lambda_{mn}}\right) Z_{mn}^3(M) \tag{9}$$

which can be shown to coincide with the solution of

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The Determination of Green's Tensor in Equilibrium Problems of a
Sloping Shell

S.A. Ambartsumyan (5). In our paper (2) we did not
take tangential displacements into account, and the
approximate expression for the deflection which we
obtained naturally differs from Eq (9).
This is a complete translation.

SUBMITTED: April 20, 1959

Literature references:
1) Kil'chevskiy, M.O. Approximate method of calculating
displacements in cylindrical shells. Zbirnik prats'
instituty matem. AN Ukr.SSR Nr 8, 1946.
2) Fradlin. B.N., Shakhnovskiy, S.M. Functional equili-
brium equations of sloping shells. Izv.AN SSSR OTN
(Mekhanika i mashinostroyeniye), Nr 1, 1959.
3) Vlasov, V.Z. General theory of Shells, GITTL, 1949.
4) Mishonov, M. Theory of Sloping Shells, Prikladnaya
Matematika i Mekhanika, Vol 22, Part 5, 1958.

Card 5) Ambartsumyan, S.A. The Calculation of Sloping Shells.
11/11 PMM Vol 11, Part 5, 1947.

SOV/21-59-11-7/27

(

AUTHORS: Fradlin, B.N. and Shakhnovs'kyy, S.M.

TITLE: Design of a Plan-Rectangular Depressed Shell

PERIODICAL: Dopovidi Akademiyi nauk Ukrayins'koyi RSR, 1959,
              Nr 11, pp 1202 - 1205   (USSR)

ABSTRACT: Using the method developed by M.O. Kil'chevs'kyy
              /¯Ref 1_7 the authors formulate a system of integral
              equations of a gentle shell equibalance

$$W_{(i)\beta}\left(M,N\right) = V_{(i)\beta}\left(M,N\right) - \int_0^a \int_0^b K^{(\prime)}_{(\beta)}\left(Q,M\right) u_{(i)j}\left(Q,N\right) dx_q \, dy_q$$

              where $i, \beta = 1,2,3;$ $\alpha = 1,2;$ according to index
              $j = 1,2,3$ the summing up is performed;
              $m,n = 1,2,\ldots\infty$, and find a solution for that
              system, also determine the Greene tensor components
              (10) and (12) for the problem of the equibalance of
              a depressed shell which is rectangular in the plane.
Card 1/2   In this work the authors raise no claim to have con-

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On the Calculation of a Rectangular Gentle Shell

tributed anything substantially new in subject matter. Instead, they recurrently mention that their calculations yield results coinciding with and confirming those arrived at by V.Z. Vlasov $\angle$ Ref 2 $\angle$, S.A. Ambartsumyan $\angle$ Ref 4 $\angle$ and M. Myshonov $\angle$ Ref 5 $\angle$. There are 5 Soviet references.

ASSOCIATION: Kyyivs'kyy politekhnichnyy instytut (Kiyev Polytechnical Institute)

PRESENTED: By F.P. Byelyankin, Member, AS UkrSSR

SUBMITTED: April 17, 1959

Card 2/2

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AUTHORS: Savin, G.N., Putyata, T.V., Fradlin,   SOV/41-11-4-8/15
            B.N., and Shakhnovskiy, S.M.

TITLE: Nikolay Aleksandrovich Kil'chevskiy (on the Occasion of his 50th
            Birthday)

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1959,Vol 11,Nr 4,pp 431-433
            (USSR)
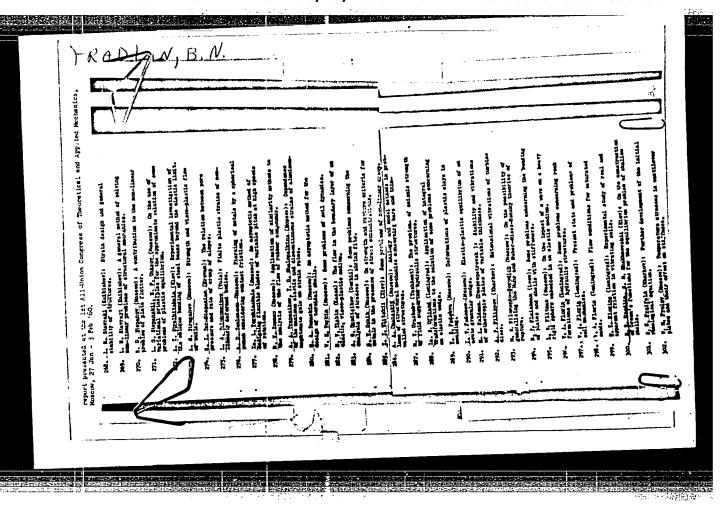
ABSTRACT: This is an appreciation of the merits of the Professor of the
            Kiyev University N.A.Kil'chevskiy. He was born in 1909, he
            finished his studies in 1933, canditate dissertation in 1936,
            doctorial dissertation in 1940. He was a pupil of Professor
         I. Ya. Shtayerman, Corresponding Member of the Academy of Sciences
            Ukr.SSR. Since 1944 he is the director of the Chair of
            Theoretical Mechanics. His special branch: Theory of elasticity.
            There follows an index of publications with 45 titles and a
            photo of N.A.Kil'chevskiy.

Card 1/1

FRADKIN, B. N.

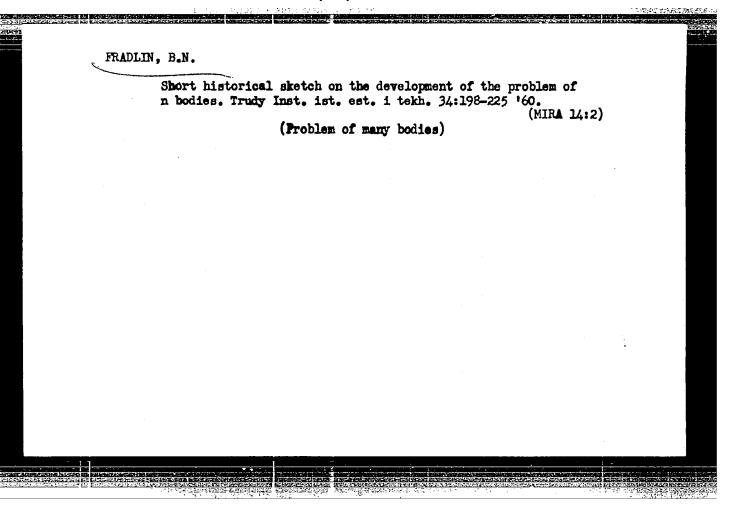report presented at the 3rd All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

FRADLIN, B.N. (Kiyev); SHAKHNOVSKIY, S. [Shakhnovs'kyi, S.M.] (Kiyev)

Determining the displacements of a shallow shell subjected to the
action of an arbitrary load. Prykl.mekh. 6 no.4:393-402 '60.
(MIRA 13:11)

1. Kiyevskiy politekhnicheskiy institut.
                (Elastic plates and shells)

FRADLIN, B.N.

Short historical sketch on the development of the problem of
n bodies. Trudy Inst. ist. est. i tekh. 34:198-225 '60.

(MIRA 14:2)

(Problem of many bodies)

S/020/60/131/06/19/071
B014/B007

AUTHORS: Fradlin, B. N., Shakhnovskiy, S. M.

TITLE: The Construction of the Green Tensor for the Problem of the
             Equilibrium of a Small-angle Shell of Double Curvature

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 131, No. 6, pp. 1298 - 1300

TEXT: With the integral equation (1) the system of functional equations for a
small-angle shell is written down according to N. A. Kil'chevskiy; further, the
authors give formula (2) for the required displacement. Thus, equation (4) is
obtained for the functional equation (1), the solution of which is given as (6).
This equation is simplified for the case of a hinged suspension of the shell and
solution (9) is obtained. The expressions obtained by V. Z. Vlasov (Ref. 2) and
M. Mishonov (Ref. 4) for the deformation of the shell and for the displacement
components respectively are found to agree with the corresponding components of
the Green tensor determined by (9). This result shows the equivalence of the
integral- and differential equation systems of the shell equilibrium. There are
4 Soviet references.

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The Construction of the Green Tensor for the Problem of   S/020/60/131/06/19/07;
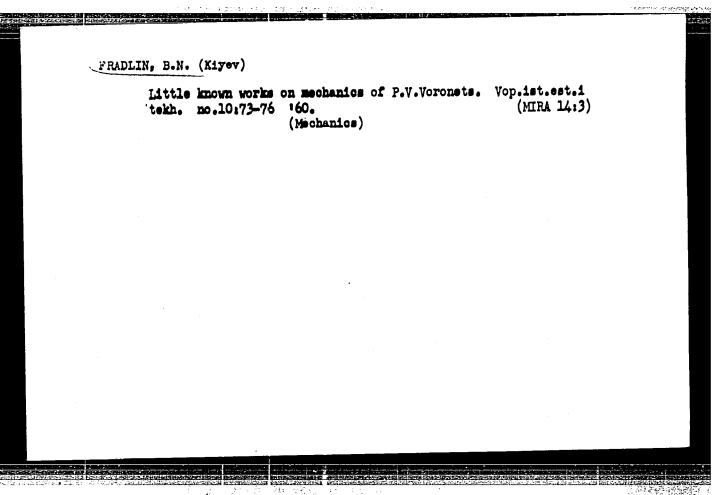the Equilibrium of a Small-angle Shell of Double Curvature B014/B007

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiev Polytechnic Institute)

PRESENTED: July 9, 1959, by Yu. N. Rabotnov, Academician

SUBMITTED: June 18, 1959

Card 2/2

FRADLIN, B.N. (Kiyev)

Little known works on mechanics of P.V.Voronets. Vop.ist.est.i
tekh. no.10:73-76 '60.   (MIRA 14:3)
                    (Mechanics)

24.4200

36997
S/044/62/000/003/044/092
C111/C444

AUTHORS: Fradlin, B. N., Shakhnovskiy, S. M.

TITLE: Integral equations for the equilibrium of flat shells with rectangular ground plane

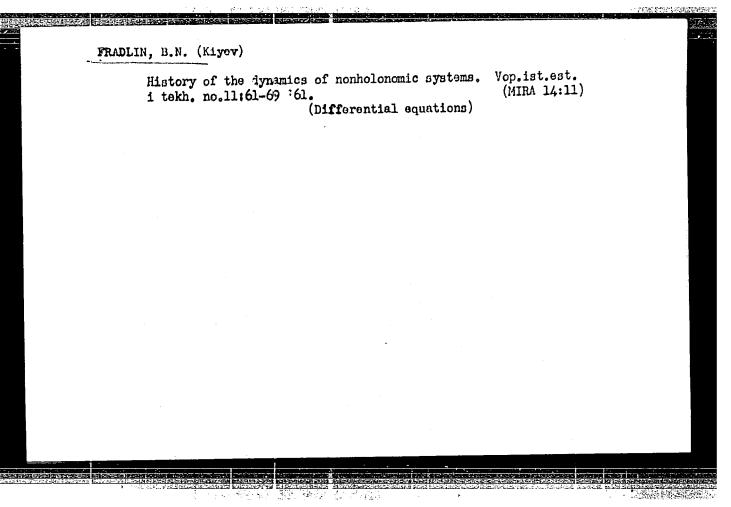PERIODICAL: Referativnyy zhurnal, Matematika, no. 3, 1962, 76, abstract 3B324. ("Izv. Kiyevsk. politekhn. in-ta", 1961, 31, 104-121)

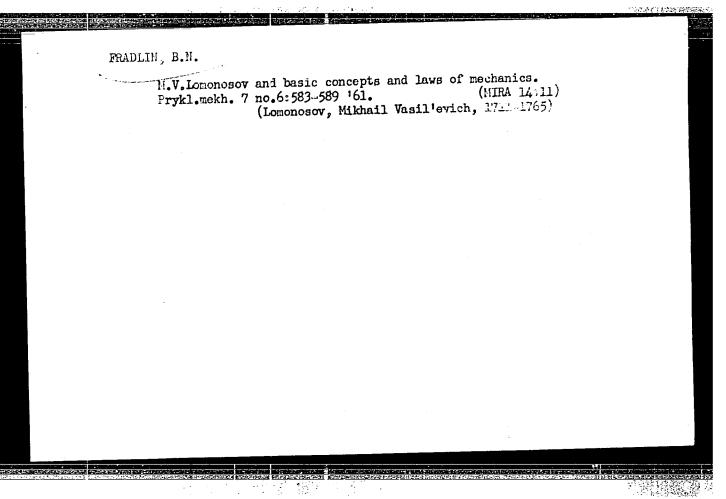TEXT: The author uses the method of N.A. Kil'chevskiy and the formulas of V. Z. Vlasov and obtains the equation of the problem in the form of a certain integro-functional equation. It is shown that under certain additional suppositions on the distribution of the load of the shells this equation can be reduced to the solution of a system of Fredholm integral equations.

[Abstracter's note: Complete translation.]

Card 1/1

FRADLIN, B.N. (Kiyev)

History of the dynamics of nonholonomic systems. Vop.ist.est.
i tekh. no.11:61-69 '61.   (MIRA 14:11)
                    (Differential equations)

FRADLIN, B.N. (Kiyev)

-. Development of the studies of the dynamics of nonholonomic system
in the Ukraine. Prykl.mekh. 7 no.5:554-560 '61.   (MIRA 14:10)

1. Kiyevskiy politekhnicheskiy institut.
(Dynamics)

FRADLIN, B.N.

M.V.Lomonosov and basic concepts and laws of mechanics.
Prykl.mekh. 7 no.6:583-589 '61.   (MIRA 14:11)
            (Lomonosov, Mikhail Vasil'evich, 1711-1765)

PUTYATA, T.V. (Kiyev); FRADLIN, B.N. (Kiyev)

Review of the scientific activities of G.K.Suslov. Ist.mat.-
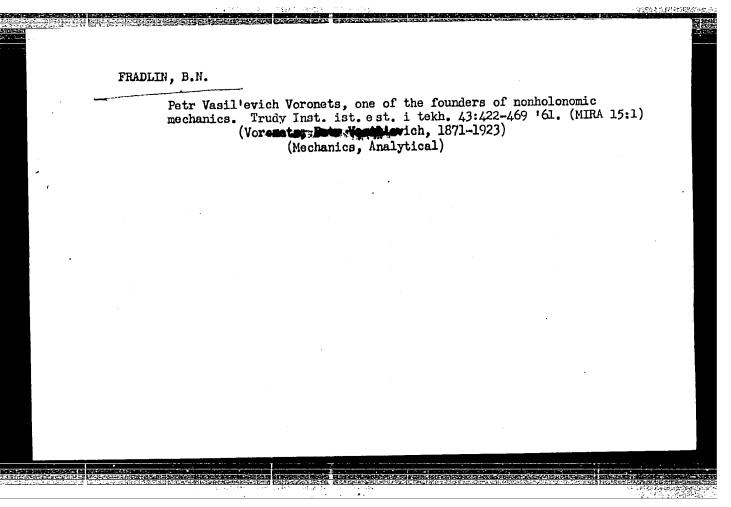zbir. 2:89-103 '61.   (MIRA 15:4)
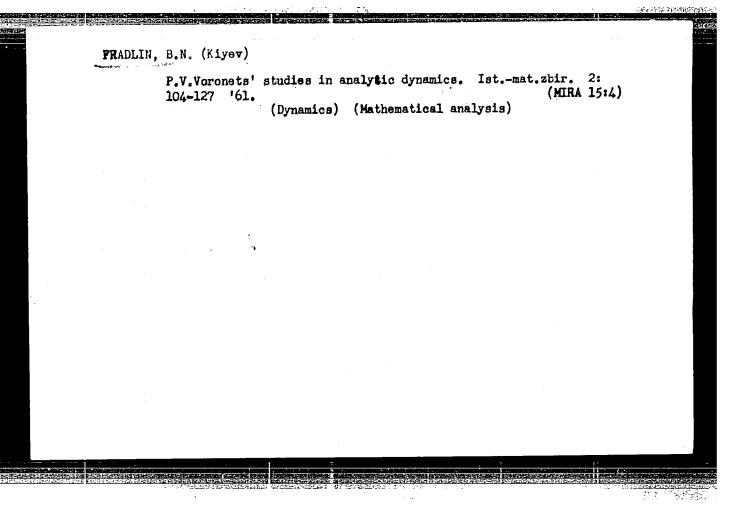   (Suslov, Gavriil Konstantinovich, 1857-1937)

KIL'CHEVSKIY, N.A. [Kil'chevskiy, M.O.]; PUTYATA, T.V.; FRADLIN, B.N.
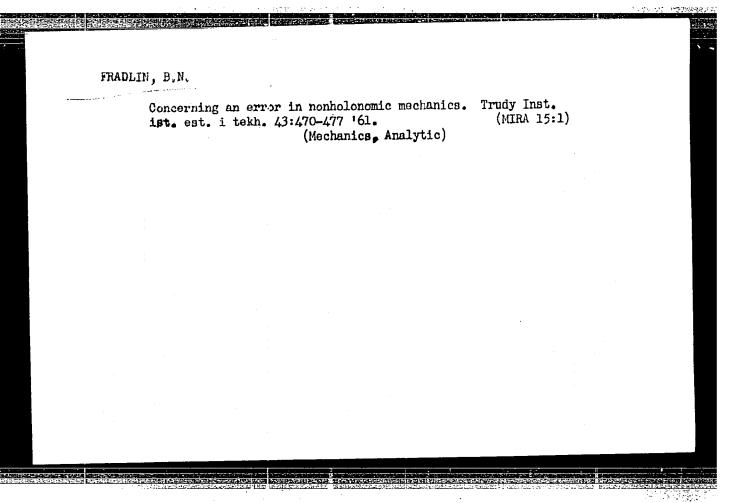
Illia Iakovlevych Shtaerman (on the occasion of his 70th birthday).
Prykl.mekh. 7 no.6:681-682 '61.   (MIRA 14:11)
            (Shtaerman, Illia Iakovlevich, 1891-)

FRADLIN, B.N.

Petr Vasil'evich Voronets, one of the founders of nonholonomic
mechanics. Trudy Inst. ist. est. i tekh. 43:422-469 '61. (MIRA 15:1)
(Voronets, Petr Vasil'evich, 1871-1923)
(Mechanics, Analytical)

FRADLIN, B.N. (Kiyev)

P.V.Voronets' studies in analytic dynamics. Ist.-mat.zbir. 2:
104-127 '61.   (MIRA 15:4)
(Dynamics) (Mathematical analysis)

FRADLIN, B.N.

Concerning an error in nonholonomic mechanics. Trudy Inst.
ist. est. i tekh. 43:470-477 '61.   (MIRA 15:1)
                         (Mechanics, Analytic)

FRADLIN, B.N.; SHAKHNOVSKIY, S.M. [Shakhnov'kyi, S.M.]

Determination of Green's tensor for a shallow shell on an
elastic base. Dop. AN URSR no.1:23-26 '62.   (MIRA 15:2)

1. Kiyevskiy politekhnicheskiy institut. Predstavleno
akademikom AN USSR G.N.Savinym [Savin, H.M.].
                (Elastic plates and shells)
                (Calculus of tensors)

FRADLIN, B.N.

P.Appell's studies on the dynamics of nonholonomic systems.
Ist.-mat. zbir. 3:96-105 '62.

Problem of the rotation of a solid body around a fixed point
and the role of Russian scientists in developing this theory.
106-115   (MIRA 16:10)

FRADLIN, B. N. (Kiyev)

Dynamics of living organisms in IA. I. Grdina's works. Prykl.
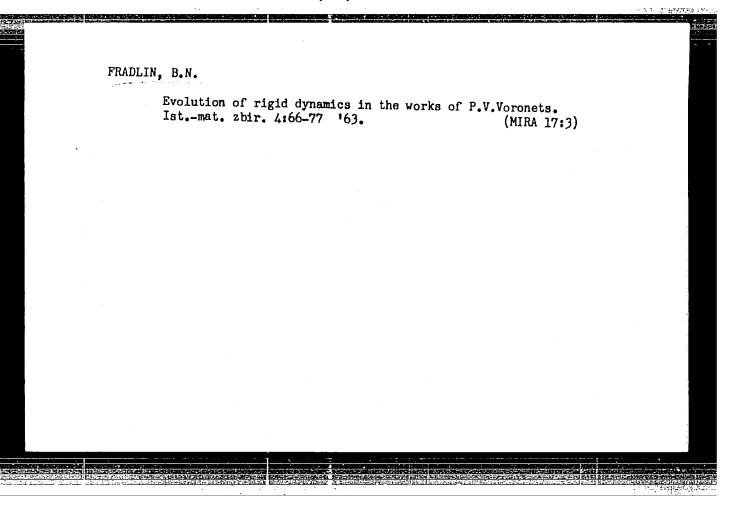mekh. 8 no.6:581-591 '62.   (MIRA 15:10)

1. Kiyevskiy politekhnicheskiy institut.

(Human engineering)

FRADLIN, B.N. (Kiyev)

A forgotten paper by I.V. Meshcherskii. Vop. ist. est. i tekh.
no.13:75-76 '62.   (MIRA 16:5)

(Dynamics of a particle)

FRADLIN, B.N.

P.V.Voronets' last research. Prykl.mekh. 9 no.2:117-125 '63.
(MIRA 16:3)

1. Kiyevskiy politekhnicheskiy institut.
.(Mechanics, Analytic)

FRADLIN, B.N.

Evolution of rigid dynamics in the works of P.V.Voronets.
Ist.-mat. zbir. 4:66-77 '63.   (MIRA 17:3)
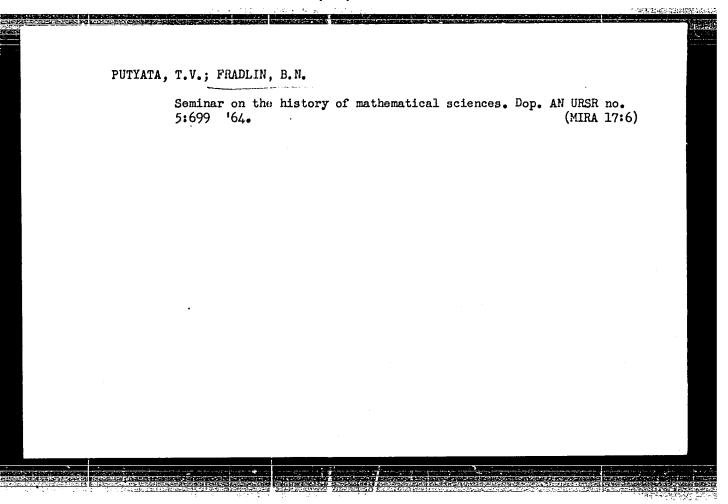
SAVIN, G.N. [Savin, H.M.]; SOKOLOV, Yu.D.; PUTYATA, T.V.; FRADLIN, B.N.

Oleksandr IUliiovych Ishlins'kyi; on the occasion of his
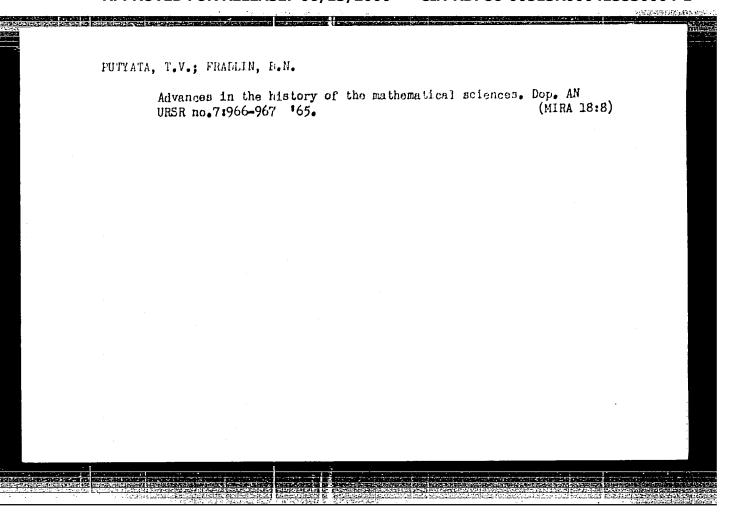50th birthday. Prykl. mekh. 9 no.4:450-454 '63.
(MIRA 16:8)

SAVIN, G.N. [Savin, H.M.] (Kiyev); PUTYATA, T.V. (Kiyev); FRADLIN, B.N.
     (Kiyev)

    Scientific heritage of P.V. Voronets' (1871-1923). Prykl.
    mekh. 9 no.6:581-591 '63.   (MIRA 16:12)

PUTYATA, T.V.; FRADLIN, B.N.

Seminar on the history of mathematical sciences. Dop. AN URSR no.
5:699 '64. (MIRA 17:6)

FRADLIN, B.N. (Kiyev)

Commutation of the operations of differentiation and variation in analytic mechanics. Prykl. mekh. 10 no.5:465-476 '64.
(MIRA 17:10)

1. Kiyevskiy politekhnicheskiy institut.

PUTYATA, T.V.; FRADLIN, B.N.

Advances in the history of the mathematical sciences. Dop. AN
URSR no.7:966-967 '65.   (MIRA 18:8)

FRADLIN, B.N. (Kiyev)

> Some peculiarities and regularities in the development of nonholonomic mechanics. Prikl. mekh. 1 no.8:1-6 '65.
>
> (MIRA 18:9)

> 1. Kiyevskiy politekhnicheskiy institut.

L $\overline{50790-65}$ EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(k)/EWA(h)   Pf-4/Pg-4/
Peb   IJP(c)   WW/EM

ACCESSION NR: AP5014820   UR/0198/65/001/005/0006/0010

AUTHORS: Fradlin, B. N. (Kiev); Shakhnovskiy, S. M. (Kiev)

TITLE: On a thin shell equilibrium

SOURCE: Prikladnaya mekhanika, v. 1, no. 5, 1965, 6-10

TOPIC TAGS: shell theory, integral equation, integro differential equation,
functional equation, shell stability

ABSTRACT: The stability conditions of a plane thin shell were analyzed mathemat-
ically using the functional equations

$$u_{i\beta}(M; N) = v_{i\beta}(M; N) -$$
$$-\int_0^a \int_0^b K^j_{(\beta)}(Q; M) u_{ij}(Q; N) \, dx_Q dy_Q + A_{i\beta}(M; N)$$

where $u_{i\beta}$ and $v_{i\beta}$ indicate the displacements of the shell and the plate. This
integro-differential equation is written as an integral equation in the form

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ACCESSION NR: AP5014820

$$u_{(i)\beta}(M; N) = v^*_{(i)\beta}(M; N) - \int_0^a \int_0^b K'^*_{(\beta)}(Q; M) u_{(i)j}(Q; N) dx_Q dy_Q.$$

$$v^*_{(i)\beta} = v_{(i)\beta} + \Delta v_{(i)\beta},$$

and a special shell structure is selected which is fixed at two sides and hinged at the other two. The function $\Delta v_{1\beta}$ is obtained in the form

$$\Delta v_{(i)\alpha} = f^\alpha_0; \quad \Delta v_{(i)3} = f^3_0 + x(x-a) f^3_1,$$

$$f^3_0 = \frac{x-a}{a} v_{(i)j}(0, y) - \frac{x}{a} v_{(i)j}(a, y);$$

$$f^3_1 = -\frac{x-a}{a^2} \left(\frac{\partial \psi^3_0}{\partial x}\right)_{x=0} - \frac{x}{a^2} \left(\frac{\partial \psi^3_0}{\partial x}\right)_{x=a};$$

$$\psi^3_0 = v_{(i)3} + f^3_0,$$

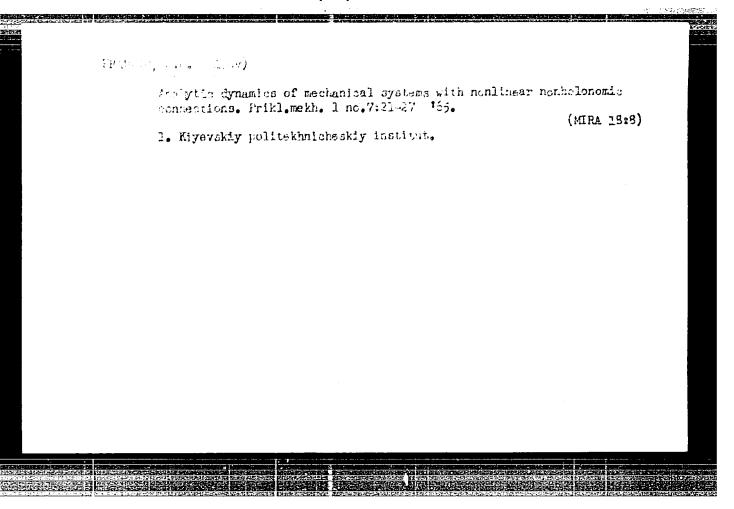and the solution of the integral equation is expressed by

$$u_{(i)\beta}(M; N) = \sum_{m,n} [E^{(i)\beta}_{mn}(N) Z^\beta_{mn}(M) + A^{(i)\beta}_{mn} Z^j_{mn}(N) Z^\beta_{mn}(M)].$$

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L 53790-65
ACCESSION NR: AP5014820

The results are extended to the case where the shell is hinged at the edges $y = 0$, $y = b$ and has an elastic displacement along the edges $x = 0$ and $x = a$ which is arbitrary in a direction normal to the sides but is zero along the vertical direction. Orig. art. has: 04 equations.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiev Polytechnic Institute)

SUBMITTED: 13Jan65   ENCL: 00   SUB CODE: QS,ME

NO REF SOV: 004   OTHER: 000

Am

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PROVAL, ... (...)

Analytic dynamics of mechanical systems with nonlinear nonholonomic connections. Prikl.mekh. 1 no.7:21-27 '55.

(MIRA 18:8)

1. Kiyevskiy politekhnicheskiy institut.

SAVIN, Guriy Nikolayevich, akademik; PUTYATA, Tat'yana Vasil'yevna
    FRADLIN, Boris Naumovich; BELASH, I.K., red.; GILELAKH,
    V.I., red.

    [Essays on the development of some basic problems in
    mechanics] Ocherki razvitiia nekotorykh fundamental'nykh
    problem mekhaniki. Kiev, Naukova dumka, 1964. 375 p.
                                        (MIRA 17:12)

    1. Akademiya nauk Ukr.SSR (for Savin).

FRAENKEL, D.

Measurement of maximum active and dissymetric power in three-phase systems. p. 82
(ELECTROTEHICA. Vol. 5, No. 3, Mar. 1957, Rumania)

SO: Monthly List of East European Accessions (EEAL) LC. Vol. 6, No. 12, Dec. 1957
Uncl.

CZECHOSLOVAKIA

M. LUKASIEWICZ and E. FRAFFKEL, Department of Pharmacology, Medical Faculty, P.J. Safaryk University (Farmakologicky ustav lekarskej fakulty UPJS [University P.J. Safaryka],) Kosice.

"Method for Evaluation of Analgesic Effect."

Prague, Ceskoslovenska Farmacie, Vol 12, No 2, Feb 63; pp 85-89.

Abstract [English summary modified]: Description of device for automatic administration of painful stimuli together with recording of motor reaction and respiration movements. Diagram, 4 graphs, 2 tables; 2 Czech and 5 Western references.

FRAENKEL, H.

The AC-DC comparator, a high precision instrument for measuring alternating current. p. 63.

POMIARY, AUTOMATYKA, KONTROLA. Warszawa, Poland. Vol. 5, no. 2, Feb. 1959.

Monthly List of East European Accessions(EEAI), LC, Vol. 8, no. 8, Aug. 1959. Uncl.

SHKREBEL', M.Ya.. Prinimali uchastiye: BLAGOVESHCHENSKAYA, K.A.;
DZYUBENKO, G.F.; FRAGAYLOVA, V.I.; ZALESSKAYA, L.O.; KOTSERUBA,
L.P.; KOVBASENKO, L.A.; LYAUDANSKAYA, B.Ye.; MILOVZOROV, P.Z.
[deceased]; NEZHURBEDA, M.P.; SNITKO, K.I.; YANTSOVA, A.V..
KRESHCHENSKIY, Ye.S., tekhn.red.

[Economy of Kiev Province; a statistical manual] Narodnoe kho-
ziaistvo Kievskoi oblasti; statisticheskii sbornik. Kiev, Gos.
stat.izd-vo, 1959. 255 p.
(MIRA 13:3)

1. Kiev (Province) Statisticheskoye upravleniye. 2. Nachal'nik
statisticheskogo upravleniya Kiyevskoy oblasti (for Shkrebol').
(Kiev Province--Statistics)

ACC NR: AP6017561   (A)   SOURCE CODE: UR/0403/66/000/002/0011/0013

AUTHOR: Fragin, I. (Candidate of technical sciences, Chief of laboratory for
abrasive machining)

ORG: NII of Tractor Technology and Agricultural Machine-Building
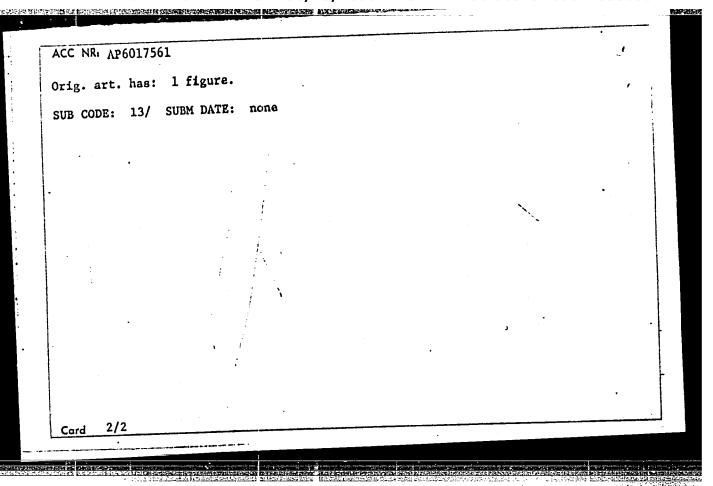(NIItractorosel'khozmash)

TITLE: Peculiarities of honing by synthetic and natural diamonds

SOURCE: VDNKh SSSR. Informatsionnyy byulleten', no. 2, 1966, 11-13

TOPIC TAGS: honing, abrasive, cutting tool

ABSTRACT: Experiments conducted at the NII of Tractor Technology and Agricultural
Machine-Building (NIItractorosel'khozmash) have established the basic criteria for
estimating the quality of honing stones with the emphasis placed on their hardness.
These permit the users to estimate the honing head productivity measured in grams of
metal removed by a square centimeter of honing head surface per minute, limiting ex-
penditure of stones during optimum conditions in milligram per kilogram of metal, and
the expected surface finish after the honing operation. The various methods of
mounting honing heads are presented. In general, they differ according to the dia-
meter of the internal metal cylinder. The desing methods for honing machines in
accordance with the mounting modes of the honing heads and other features, such as
the measuring devices with collapsible and noncollapsible honing heads are surveyed.

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ACC NR: AP6017561

Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: none

Card   2/2

KHUDOBIN, L.V.; FRAGIN, I.Ye.

Analyzing operating cycles of automatic cylindrical grinding machines. Nauch.dokl.vys.shkoly; mash.i prib. no.4:134-143 '58.   (MIRA 12:5)

1. Stat'ya predstavlena kafedroy "Tekhnologiya mashinostroyeniya" Moskovskogo stankoinstrumental'nogo instituta.
                    (Grinding machines)

S/121/60/000/011/004/013
A004/A001

AUTHOR: Fragin, I. Ye.

TITLE: Automation of Circular Grinding Processes

PERIODICAL: Stanki i Instrument, 1960, No. 11, pp. 9-11

TEXT: The author points out that the main factor determining the productivity of grinding processes is the radial pressure of the grinding wheel on the workpiece. This was confirmed by investigations carried out by the department "Tekhnologiya mashinostroyeniya" ("Technology of Mechanical Engineering") of the Mosstankin. Therefore, the process of grinding and automation of the operation cycle should be carried out under consideration of this pressure. The formula for the duration of the optimum grinding cycle reads as follows:

$$\tau_{\Delta} = \frac{C_1}{t_0} + \frac{Pr_3}{t_0 J_c} \ln \frac{t_0}{t_0 - t_3} + \frac{C_3}{t_3} + \frac{Pr_3}{J_c t_3} \ln \frac{Pr_3}{Pr_3 C_4 J_c} \,, \qquad (1)$$

where C_1 = path being covered by the grinding wheel up to the moment of contact with the workpiece ("grinding the air"), which is approximately 0.1 - 0.15 mm; C_3 = lateral tolerance for the period of steady grinding in mm; C_4 = lateral

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Automation of Circular Grinding Processes

tolerance for the period of withdrawal in mm; t_0 = rapid feed during "grinding the air" and infeed in mm/min; t_3 = actual feed during steady grinding in mm/min; J_c = rigidity of the СПИД (SPID) grinding system in kg/mm; Pr_3 = radial stress during the period of steady grinding in kg; τ_A = time of optimum grinding cycle in minutes. As it can be seen from the formula, the main characteristic features of the optimum cycle are; rapid wheel approach and infeed until the fixed radial pressure is attained, constant radial pressure in the period of steady grinding and ordinary withdrawal. If the magnitude of H_{rms} (height of roughness in μ) is given (Translator's note: the Russian abbreviation is H_{ck}), it is not difficult to find the withdrawal tolerance necessary to obtain the corresponding surface finish. Figure 2 shows a graph for the determination of the grinding time for longitudinal

Figure 2:

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S/121/60/000/011/004/013
A004/A001

Automation of Circular Grinding Processes

grinding, while Figure 3 presents the time for infeed grinding. The left vertical scale shows the withdrawal tolerance for the required surface finish. The toler- ance for the period of steady grinding is equal to the difference between the medium tolerance and the withdrawal tolerance. Then the time for the individual periods and the total time of the grinding cycle are determined. The model 3151 grinding machine was chosen for automation of the grinding cycle. The fixed radial pressure was maintained by feed variations of the grinding stock. The sequence of operation of the system is shown in the schematic of Figure 4. The radial stress is measured by induction pickup 1. If at the input of the sys- tem a stress arises which exceeds the fixed one, a signal is produced at the pickup output. The difference between pickup voltage and the voltage which corresponds to the fixed radial pres- sure is amplified by electronic ampli- fier 2 and EMU 3. From the EMU-terminal

Figure 3:

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Automation of Circular Grinding Processes

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A004/A001

Figure 4:

Рис. 4. Принципиальная схема системы пневмоавтоматики.

the signal enters the armature circuit of d-c motor 4 with independent excitation. From the motor rotation is imparted, through reducer 5, to face cam 6 of the infeed mechanism. When the cam revolves the grinding stock is displaced until the pickup signal and the signal corresponding to the fixed radial pressure are equal as to the absolute magnitude. To increase the sensitivity, the sliding guides of the grinding stock were replaced by antifriction roller guides which ensured the stable work of the measuring unit of the radial grinding stress. The operation cycle of the machine starts with the grinding wheel being advanced to the workpiece with the given feed of the grinding stock, which is ensured by a certain voltage taken from the voltage divider. The induction pickup is switched off during accelerated infeed. The contact between wheel and workpiece and the infeed are accompanied by a load increase on the grinding wheel drive motor, i. e. an increase in the linear current of the motor. The maximum current relay connected into one of the

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Automation of Circular Grinding Processes   S/121/60/000/011/004/013
                                                   A004/A001

supply lines of the motor is actuated when the current attains a certain fixed magnitude and locks the relay circuit, thus transferring the system to automatic control. Since an accurate control of the maximum current relay is rather difficult, a second version has been developed – infeed up to a given pressure. The rapid advance of the wheel to the workpiece is effected at a travel speed which, in its turn, depends on the magnitude of the unbalance signal. Infeed takes place with an even increase in radial stress up to the given magnitude for the period of steady grinding. As it can be seen from Figure 4, the displacement of the grinding stock is actuated by a servomotor by way of a gear reducer a screw-nut pair, rack and pinion and face cam with roller. The gear ratio of the gear reducer is $1 - \frac{1}{36}$. The servomotor is an ЭП 110/245 (EP 110/245)-type electromotor with $n = 3,600$ rpm and 245-w power. When operating at an automatic cycle, the period of steady grinding decreased by 90%, while the total time was cut by 21% compared with the grinding on non-automated machines. The grinding conditions did, however, not reach their maximum efficiency since a soft 34бСМ1К (246SM1K) grinding stone was used with which only a radial pressure of up to 5.2 kg per 1 cm of wheel width can be produced. Therefore, harder wheels of the CT1-CT2 (ST1-ST2) grades are recommended with which the productivity during steady grinding can be increased by 30%, since the radial stress obtained with these wheels amounts to 30-50 kg. There are 5 figures and 7 Soviet references.

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FRAGIN, I. YE., CAND TECH SCI, "INCREASE OF PRODUCTIVITY IN CENTERED CIRCULAR GRINDING." MOSCOW, 1961. (STATE COMMITTEE OF THE COUNCIL OF MINISTERS USSR FOR AUTOMATION AND MACHINE BUILDING. CENTRAL SCI RES INST OF TECHNOLOGY AND MACHINE BUILDING "TSNIITMASH". DEPARTMENT OF SCI-TECH INFORMATION).

(KL, 2-61, 213).

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FRAGIN, I. YE.

S/121/62/000/002/002/004
D040/D11?

AUTHORS: Lur'ye, G.B., Polyanskiy, P.M., Mazurkevich, V.V., Kublanov,V.L.,
Savel'yev, Yu.N., and Fragin, I.Ye.

TITLE: Automation of cylindrical grinding machines

PERIODICAL: Stanki i instrument, no. 2, 1962, 16-21

TEXT: New units designed for automating model 3151, 3161 and 3152 cylindrical grinders are described. These units, also suitable for other grinders of this type, were developed by the Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya (NIITrak-toresel'khozmash) (Technological Scientific Research Institute of Tractor and Farming Machines) in conjunction with the Moskovskiy avtomekhanicheskiy institut (MAMI) (Moscow Automechanical Institute). A simple grinder equipped with such units is converted into an automatic plunge-cut grinder. The following operations are automated: installing and clamping the work; positioning the work at the side face of the grinding wheel; measuring the work prior to and during grinding, with automatic control commands; moving the grinding head at different speeds; unclamping and removing the work as

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Automation of cylindrical ...

well as passing it on to the next machine; controlling the wheel dressing and the dressing process. The operation of individual automatic units is described, and the turning mechanism of an "automatic operator" with two gripping "hands", a self-clamping chuck, etc., is described. A grinder fitted with the units and set for grinding the necks of tractor track wheel axles is shown in a photograph. Reference is made to an automatic-control multicommand unit designed for controlling multistage grinding processes characteristic of modern grinding machines (Ref. 2: Izmeritel'noye ustroystvo dlya upravleniya dvizheniyem shlifoval'noy babki krugloshlifoval'nogo stanka [An ... device for controlling the motion of the grinding head of cylindrical grinding], Author's Certificate no. 129122, of 18.3.1959; Ref. 7: Polyanskiy, P.M., Articles in the Symposium "Pribory i ustroystva aktivnogo kontrolya" ["Automatic Regulation Instruments and Devices"]. Mashgiz, 1961). Foreign practice is referred to (British, Czechoslovakian, German) as regards grinding allowances and time losses caused by high allowances. The importance of automating Soviet grinders is stressed since most grinders still operate with hand-feed. There are 10 figures and 10 references in: "Time and Motion Study", no. 4, 1957, pp 15-25, and the catalogue of the Churchill Co.

Card 2/2

KUBLANCV, V.L.; FRAGIN, I.Ye.

Over-all automation of the 3151 and 3152 circular grinding
machines. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i
tekh.inform. no.3:27-30 '62. (MIRA 15:5)
(Grinding machines) (Automation)

FRAGIN, I.Ye., kand.tekhn.nauk

Correcting the initial error in grinding by the method of
longitudinal machining. Vest.mash. 42 no.4:69-73 Ap '62.
(MIRA 15:4)

(Grinding and polishing)

FRAGIN, I.Ye.

Honing of tractor engine bushings with bars made of
synthetic diamond powder. Stan. i instr. 34 no.10:25-27
O '63.   (MIRA 16:11)

FRAGIN, I.Ye., kand. tekhn. nauk; SAFRONOV, V.G., inzh.

Correction of the initial error in lapping holes with a free
abrasive. Vest. mashinostr. 43 no.7:67-69 Jl '63.

(MIRA 16:8)

(Grinding and polishing)

FRAGIN, I.Ye.; G-FROROV, V.I.

Diamond honing of holes in hardened steel parts. Stan. i instr.
35 no.7:34-36 Jl '64.   (MIRA 17:10)

FRAGIN, I.Ye., kand. tekhn. nauk

Introduction of diamond honing at branch plants. Trakt. i sel'-
khozmash. no.9:39-40 S '64.   (MIRA 17:11)

FRAGIN, I.Ye.

Honing the sleeves of tractor engines with bars of synthetic and
natural diamords. Stan. i instru. 36 no.1:3-6   Ja '65.

(MIRA 18:4)

L 05107-67   EWT(d)/FSS-2/EWT(1)

ACC NR: AP6013247   SOURCE CODE: UR/0413/66/000/008/0036/0036

AUTHORS: Rodin, N. S.; Fragin, I. Ya.; Reyfe, Ye. D.; Dedkov, V. I.

ORG: none

TITLE: A device for the mechanical retuning of superhigh frequency instruments.
Class 21, No. 180651

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 8, 1966, 36

TOPIC TAGS: superhigh frequency, receiver tuning

ABSTRACT: This Author Certificate presents a device for the mechanical retuning
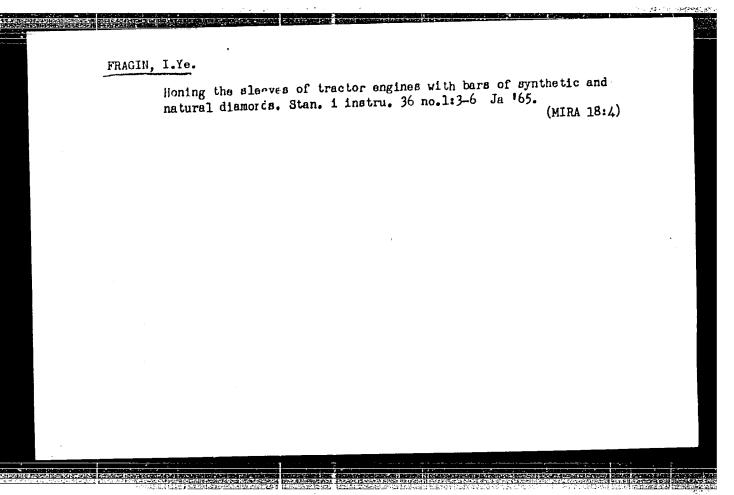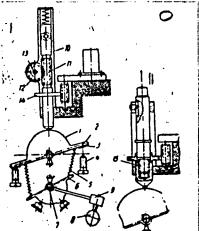of superhigh frequency (SHF) instruments. The device includes a cam connected
with the drive motor, and a spring-loaded rod which bears on the cam and is con-
nected with the tuning unit of the SHF instrument. The design increases the re-
tuning precision when the tuning system is combined with the fine tuning system
of the SHF instrument. A lever is fastened to the cam (see Fig. 1). Plates are
fitted on the ends of this lever. Opposite to these plates a limiter of the
lever rotation angle is mounted, connected by two springs with a second lever
fastened to a shaft. This second lever is connected with the drive motor of the

UDC: 621.396.662

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L 05107-67

ACC NR: AP6013247

Fig. 1. 1 - cam; 2 - lever; 3 - plate; 4 - limiter;
         5 - spring; 6 - lever; 7 - shaft; 8 - motor;
         9 - self-breaking transmission; 10 - rod;
         11 - worm gear; 12 - worm gear wheel;
         13 - axis; 14 - pinion gear of reduction
         train; 15 - screw couple

tuning system by a self-breaking transmission. Part of the spring-loaded rod is
made in the form of a worm gear engaged with the worm gear wheel fastened to the
axis of the retuning unit. The pinion gear of the drive motor reduction train of
the SHF instrument's fine tuning system is fastened to the lower part of the rod.
To provide the translational motion of SHF instrument's tuning unit, the spring-
loaded rod is made of two parts interconnected by a screw couple. Orig. art. has:
1 figure.
Card 2/2 SUB CODE: 09, 17/ SUBM DATE: 17Dec64

FRAGINA, A.I.

Dynamics of chemical substances in sunflowers in connection with the conditions of ripening. Trudy po prikl. bot., gen. i sel. 37 no. 1:27-38 '65   (MIRA 19:1)

89342
S/191/61/000/001/002/015
B101/B205

15 8104

AUTHORS: Golysheva, Ye. Ya., Fragina, A. R., Levin, A. N.

TITLE: Copolymerization of styrene with diallyl fumarate

PERIODICAL: Plasticheskiye massy, no. 1, 1961, 7-9

TEXT: An attempt has been made to obtain a styrene copolymer with a better
resilience and resistivity to heat than exhibited by polystyrene.
Proceeding from papers by Western authors (Ref.7), copolymerization of
styrene with diallyl fumarate (DAF) has been studied. A) Copolymerization
in emulsion with an addition of 1.5-25% diallyl fumarate to styrene was
performed with sodium hexadecane sulfonate as emulsifier and with the
following initiators: a) benzoyl peroxide; b) benzoyl peroxide plus $FeSO_4$;
c) isopropyl benzoyl hydroperoxide plus Na_2SO_3. The best results were
obtained from the latter initiator: powdery copolymers in a yield of
80-90%. Increasing content of DAF led to slower polymerization than that
of pure styrene. In organic solvents, the copolymers were unsoluble or
only partly soluble. 5.8 and 2.5% of the copolymer separated with 5 and

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Copolymerization of styrene...

10% DAF, respectively. According to an elementary analysis, the copolymers had the following composition:

Ratio of initial monomers		ratio in the copolymer	
styrene	DAF	styrene	DAF
90	10	76.8	23.2
85	15	71.6	28.4
75	25	63.3	36.7

Copolymers with 1.5, 3, and 5% DAF could be easily molded at $150\text{-}155^\circ$C and $150\text{-}180$ kg/cm^2. Pressing was complicated by a high content of DAF. According to Martens, copolymers with 1.5-5% DAF withstood a temperature of $84\text{-}89^\circ$C, and with polystyrene, 80°C. Resilience was 4.2-4.5 kg·cm/cm^2 (polystyrene: 5-15 kg·cm/cm^2); Brinell hardness was 21.5-22.7 kg/mm^2 (polystyrene: 18-19 kg/mm^2). B) Block copolymerization was carried out in sealed ampoules with 10, 15, and 20% DAF, 0.1% benzoyl peroxide; the substance was heated at 60°C until a viscous product had formed, after which it was solidified at 40°C. The entire process took about 200 hr. The polymerization process was completed by heating at $150\text{-}160^\circ$C for 10 hr. Solid, transparent copolymers could be mechanically treated. Resistivity to heat: $88\text{-}92^\circ$C; resilience: 15-18 kg·cm/cm^2; Brinell hardness: 21.2-22.8 kg/mm^2. C) Meltable and soluble copolymers were obtained by copolymerization in a solvent (varnish copolymerization). The solvent

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Copolymerization of styrene...

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B101/B205

was allyl alcohol in a ratio of 3:1 related to the total number of monomers. After the end of polymerization, the solvent was boiled down in vacuo. A 20% solution in acetone was prepared from the copolymers, which had been purified by dissolution and reprecipitation, and was then applied to metal. After heating, a firmly sticking film of varnish was obtained, which was unsoluble in acetone and withstood a temperature of 200°C for 200 hr and of 300°C for 3-5 hr. The film was tested by means of the Dupont apparatus. The laboratory assistants K. V. Valkina and F. Ye. Shapiro participated in the experiments. There are 1 figure, 1 table, and 9 references: 4 Soviet-bloc and 6 non-Soviet-bloc.

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L 46203-66   EWT(m)/EWP(j)/T/EWP(t)/ETI   IJP(c)   JD/WW/JW/JWD/RM

TITLE: Thermal decomposition of ammonium nitrate in the presence of catalysts

ABSTRACT: A study has been made of the thermal decomposition of ammonium nitrate at 200—220C in the presence of 5% of such additives as chromates of metals of groups I and II of the periodic table, potassium dichromate, or chlorides of various metals. The highest catalytic effects on the thermal decomposition of NH_4NO_3 were produced by Li_2CrO_4, $K_2Cr_2O_7$, $CuCl_2$ and $CrCl_3$. Study of the effect of such binary systems as $CuClO_4$ or $K_2Cr_2O_7$ and various chlorides showed that the highest catalytic effects on the thermal decomposition of NH_4NO_3 were produced by the systems $K_2Cr_2O_7 + BaCl_2$, $K_2Cr_2O_7 + MnCl_2$, and

Card 1/2   UDC: 662.2.393

L 46203-66

ACC NR: AP6030318

$CuCrO_4 + MnCl_2$. It was concluded that these binary systems or Li_2CrO_4 can be used as combustion catalysts for ammonium nitrate. Orig. art. has: 3 tables. [BO]

SUB CODE: 07/ SUBM DATE: 06Jun64/ ORIG REF: 005/ OTH REF: 002

Card 2/2 fv

STRELYUKHIN, A.K.; KRASIK, Ye.D.; FRAGINA, D. Yu.; TSARICHENKO, V.V.

Results of training psychiatrists at a local base in Ryazan
Province.Zhur. nevr. i psikh. 63 no.2:313-314 '63
(MIRA 16:11)

1. Kafedra psikhiatrii (zav. - prof.A.K.Strelyukhin) Ryazan-
skogo meditsinskogo instituta imeni I.P.Pavlova, Ryazanskaya
psikhonevrologicheskaya bol'nitsa (glavnyy vrach V.V.TSari-
chenko) i Ryazanskiy psikhonevrologicheskiy dispanser (glav-
nyy vrach - kand.med.nauk Ye.D.Krasik).

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FRAGNER, F.

FRAGNER, F.   Vitamins in the rye milling scheme. p. 365. Vol. 7, no. 8,
1956. PRUMYSL POTRAVIN. Praha, Czechoslovakia.

SOURCE: EAST EUROPEAN ACCESSIONS LIST (EEAL) VOL 6 NO 4 APRIL 1957

FRAGNER, J.

PROCESSES AND PROPERTIES INDEX

The progress in pharmaceutical chemistry. JIRI FRAGNER. Chem. Listy 23, 471-
6(1929).—A discussion.   FRANK SIARANN

17

ASM-SLA   METALLURGICAL LITERATURE CLASSIFICATION

FRAGNER J.

Výzkumný ústav. potravinářské technolgie, Praha. Možnosti obohacené vyzivy.
Means of enriching the diet SBORN, PATHOFYSIOL. TRAV. VYZ. (Praha) 1954, 8/1
(20-26) Tables 2

SO: Excerpta Medica, Section II, Vol. 7, No. 12

Fragner

Vitamins of fresh milk. J. Blattná, J. Frágner, and J. Krumphanzlová (Výzk. ústav potrav. technol., Prague). Průmysl Potravin 6, 420-33(1955).—The content of individual vitamins in cow milk was compared for breed, health, and food.

L. J. Urbánek

②

FRAGNER,

CZECHOSLOVAKIA/Microbiology. Technical   F-4
                Microbiology

Abs Jour   : Ref Zhur-Biologiya, No 1, 1957, 606

Author   : Fragner and Blatna
Inst   :
Title   : The Significance of Phyloquinones for
               Products of the Food Industry

Orig Pub   : Vyziva lidu, 1955, 10, No 7-8, 110-111

Abstract   : Taking into consideration the bacteri-
               cidal and bacteriostatic role of phylo-
               quinones it is proposed to utilize
               menadion (2 methyl-1, 4 naphthoquinone)
               in the dairy industry.

Card 1/1

FRAGNER, J.

Synergists of L-ascorbic acid. J. Fragner and J. Davidek
Výzk. ústav potrav. technol., Prague). Průmysl Potravin
7, 334-5(1950).—Review with 17 references. L. J. U.

FRAGNER, J.; MOSINGER, B.

FRAGNER, J.; MOSINGER, B. Enriching milk with vitamin D. p. 514

Vol. 7, no. 11, 1956
PRUMYSL POTRAVIN
TECHNOLOGY
Praha, Czechoslovakia

So: East European Accession, Vol. 6, No. 2, 1957

CZECHOSLOVAKIA / Chemical Technology. Chemical Products.   H
        Drugs. Vitanins. Antibiotics.

Abs Jour: Ref Zhur-Khimiya, 1958, No 20, 68455.

Author : Davidek J., Fragner J.
Inst   : Not given.
Title   : Photometrical Determination of Ruthenium.

Orig Pub: Ceskosl. farmac., 1957, 6, No 8, 449-450.

Abstract: A method for the determination of ruthenium (I) is
          proposed which consists in the formation of a
          brownish-red coloring when I interacts with the
          diazo n-aminobenzoic acid (II). To lcc of 0.5%
          solution of II in 10% H_2SO_4, 2cc of 0.2% $NaNO_2$
          solution is added. After mixing a solution of I
          in CH_3OH (2-28 γ/cc) is added, followed by addi-
          tional mixing and by alkalization with 5 cc of 10%
          NaOH solution, dilution to 25cc, and by photometri-

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FAHNER, J.

H.

CZECHOSLOVAKIA/Food Processing Industry.

Abs Jour   : Ref Zhur - Khimiya, No 19, 1958, 65935

Author   : Blattna, J., Fragner, J., Krumphanzlova, J.
Inst   : -
Title   : Vitamins in the Technology of Eggs.

Orig Pub   : Prumysl potravin, 1957, 8, No 6, 287-289.

Abstract   : A study has been made of the influence of the various
              methods of egg storage on their content of vitamins,
              in particular of riboflavin, axerophthol, and their pro-
              vitamins. It was established that no essential differen-
              ce exists between the separate methods of storage, accor-
              ding to these indices. The liming of eggs was shown to
              be the best method of storage; during long cold storage,
              losses of axerophthol increased as a result of oxidation
              by the oxygen of the air, which penetrates through the
              pores of the shell. Freezing the eggs reduces these

Card 1/2

CZECHOSLOVAKIA/Food Processing Industry.   H.

    Abs Jour   : Ref Zhur - Khimiya, No 19, 1958, 65935

                     losses. Greatest losses of riboflavin occur when eggs
                     fracture during daily light and free access of atmosphe-
                     ric oxygen.

       Card 2/2   2/3

CZECHOSLOVAKIA / Chemical Technology. Food Industry.   H-28

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 79476.

Author : Cerna, J., Houbova, V., Manousek, O., Fragner, J.
Inst   : Not given.
Title   : The Retention of Vitamins and Minerals in Meat
          Products.

Orig Pub: Prumysl potravin, 1957, 8, No 11, 567-571.

Abstract: The losses of thiamine (I) and riboflavin (II),
          calcium, magnesium, phosphorus and iron were stud-
          ied in a process of industrial production of sau-
          sage goods and smoked products, canned meat as
          well as boiled and frozen meat and /their/ sub-
          products. The basic causes for losses of water-
          soluble compounds is their leaching out in pick-
          ling and boiling. The effectiveness of the lea-
          ching increases proportionally to the increase
          in temperature, the time of the production pro-

Card 1/2

83

CZECHOSLOVAKIA / Chemical Technology. Food Industry.   H-28

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 79476.

Abstract: cess and the permeability of the surface layers
of the product, and it is inversely proportional
to the size of the product. The losses of I are
in addition caused by its thermal destruction,
the losses of II — by the effect of light. The
maximum losses of I (42%) and II (27%) among sau-
sage goods and smoked products were found in sos-
iski /frankfurters/. Minerals are mostly retain-
ed in those products in the amount of 90% and
even 100%, excluding Fe in ham (19% Fe is leached
out in pickling). The losses of I in canned pork
comprised 75%, that of II — 8% and in frozen
meat 23 and 3% respectively.

Card 2/2

FRAGNER, JIRI

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and   H-28
                Their Application, Part 3. - Food Industry.

Abs Jour   : Ref Zhur - Khimiya, No 14, 1958, 48493

Author   : Maria Vodova, Vera Houbova, Jiri Fragner.
Inst   : -
Title   : Upon the Contents of Inositchexaphosphoric Acid in
               Alimentary Products.

Orig Pub   : Prumysl potravin, 1957, 8, No 11, 599-603

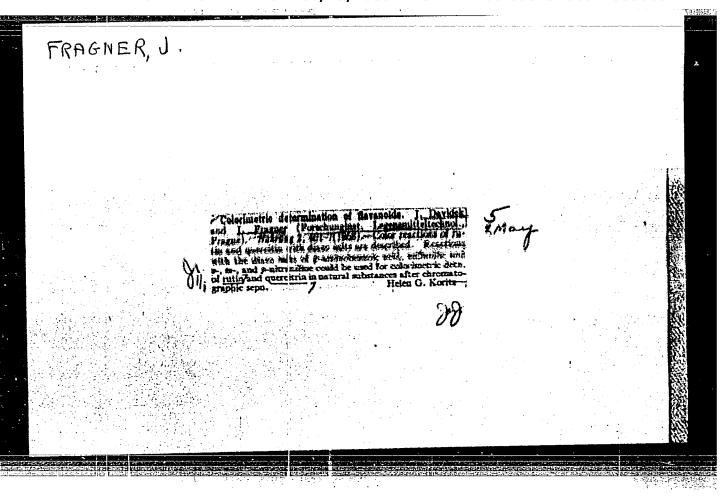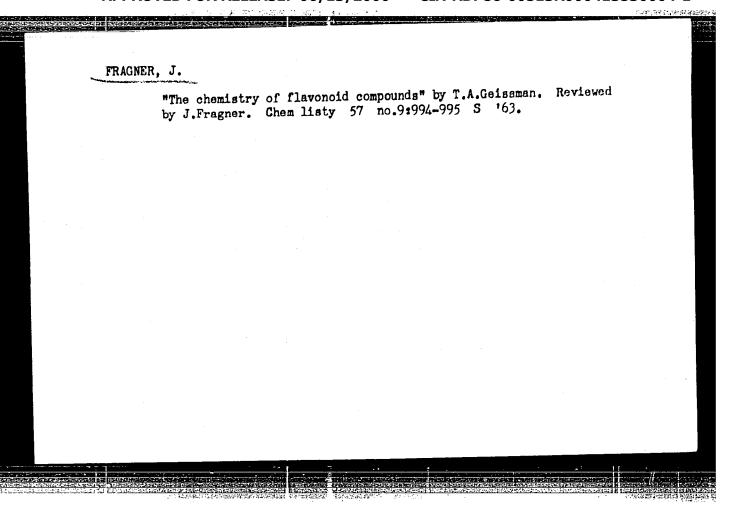Abstract   : The contents of inositchexaphosphoric acid (I) and its
               salts in grain crops, bean and olive grains was investi-
               gated by the new developed method of determination of
               bonded P. From 0.3 to 16.3% of phytin contained in a
               whole grain passes into flour when wheat is milled, and
               from 5.9 to 29.6% when rye is milled, the rest passes
               into the wastes. The destruction of I takes place under
               bread baking condition(with the exception of Graham and

        Card 1/2

                                    10

FRAGNER, J.

Colorimetric determination of flavonoids. I. Daxikek and J. Fragner (Purchuneinet, Leasessiticiltechnus. Prague), Naturels 2, 491-7 (1908)—Color reactions of rutin and quercetin with diazo salts are described. Reactions with the diazo salts of p-aminobenzoic acid, sulfanilic and o-, m-, and p-nitraniline could be used for colorimetric detn. of rutin and quercitrin in natural substances after chromatographic sepn.
— Helen G. Korits

FRAGNER, J.

"The chemistry of flavonoid compounds" by T.A.Geissman. Reviewed
by J.Fragner. Chem listy 57 no.9:994-995 S '63.

FRAGNER, J.

"The chemaitry of flavonoid compounds" by T.A.Golanman. Reviewed
by J.Fragner. Coll Cz Chem 29 no. 3:855-856 Mr '64.

BELSAN, I.; FRAGNER, P.

Onychomycosis caused by Scopulariopsis brevicaulis. Cesk.
derm. 39 no.4:233-239   Jl'64

1. I. dermato-venerologicka klinika fakulty vseobecneho
lekarstvi KU [Karlovy university] v Praze (prednosta: prof.
dr. J.Konopik, DrSc.) a Hygienicko-epidemiologicka stanice
[Krajskeho narodniho vybory] Stredoceskeho kraje v Praze
(reditelka: MUDr. M.Rejskova).

Fragner F. and Malek I. Institute of Bacteriology and Serology, Charles
Univ., Prague. Disociace u kmenu antibiotickych penicillii? On dissociation in the strains
of antibiotic penicillia Biologicke Listy 1947, 28/1 (9-18) Illus. 6

So: Physiology, Biochemistry and Pharmacology, Section II., Vol. I, #1-6

FRAGNER P. Z ustavu pro lekarskou mikrobiologii. Otazka sexualniho rozmno-
zovani u Penicillii The question of sexual multiplication of Penicillia Biologicke Listy, Pr
Prague (Czechoslovakia) 1947, 28/3 (109-118) Graphs 9, Illus. 36

It was shown that if two cultures of different strains of Penicillia are cultured together,
they either repel each other or grow together, forming at the point of contact a high
edge. At the point of contact protoplasmic bridges were observed, sometimes also
knots or whorls. In these bridges structures were seen which stained with haema-
toxylin and gave the Feulgen nuclear reaction. These structures can therefore be
considered as nuclear material. From the protoplasmic bridges 'hybrids' were
developed. All these results cannot be regarded as conclusive proof of sexual multi-
plication of Penicillia.   Traub-Brooklyn

SO: Medical Microbiology and Hygiene, Section IV, Vol. I, #1-6